



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/579,569

05/17/2006

Carsten Pabst

R.306941

5499

2119

7590

09/29/2008

RONALD E. GREIGG

GREIGG & GREIGG P.L.L.C.

1423 POWHATAN STREET, UNIT ONE

ALEXANDRIA, VA 22314

EXAMINER

MYERS, JESSICA L

ART UNIT

PAPER NUMBER

3746

MAIL DATE

DELIVERY MODE

09/29/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/579,569

Applicant(s)

PABST ET AL.

Examiner

JESSICA L. MYERS

Art Unit

3746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 1/29/2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 11-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 5/17/2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/CIS-300)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date 1/29/08, 5/17/06

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "pump of a single pump unit being actuated by a different cam than the other pumps in that unit," as disclosed in claim 12, the "rotary angle of 150° between cams," as disclosed in claim 17, and the "cams with eccentricities of different sizes," as disclosed in claims 23-25, must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner,

the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claim 11 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 11 states, in lines 3-4, that the plurality of piston pumps are combined into "at least two pump units". This implies that there could be two or more pump units, while the specification and drawings discuss and show two pump units only. It is unclear how whether the discussed plurality of pumps would be divided up to form three, four, five, or more pump units, or whether additional pumps would be needed to form the additional pump units.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Regarding claim 13, the phrase "preferably" renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 11-22, and 26-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,446,435 to Willmann et al. (Willmann et al.) in view of U.S. Patent 6,065,816 to Nakazawa (Nakazawa).

In Reference to Claim 11

Willmann et al. teach a multipiston pump (see figure 4), having a pump housing (the pump bores are contained in a housing), a motor (motor (48)), and an eccentric unit driven by the motor (cam element (70)), having an arrangement comprising a plurality of piston pumps (see figure 4), which are combined hydraulically by means of connecting conduits in the pump housing (the conduits are also contained in the pump housing) into at least two pump units (the first pump unit contains brake circuit I, while the second pump unit contains brake circuit II) which are operatively in communication with one another on the intake side and on the compression side (both pump units feed to and from the main brake line (22) which connects the two units in the pump reservoir (20)) to

supply two hydraulically separate hydraulic circuits with pressure fluid (see figure 1), and the eccentric unit and the arrangement of piston pumps being adapted structurally to one another in the pump housing such that the piston pumps of one pump unit are always actuated in alternation with the piston pumps of the second pump unit (the pumps in unit I are the pumps that are offset by 30° , 150° , and 270° , which actuate alternatively with the pumps from unit II, which are offset by 0° , 120° , and 240°) with a phase offset between the actuation of the piston pumps of one pump unit (the pumps in a single unit are offset from each other by the 120° angle of offset between them) on the one hand and the actuation of the two pump units on the other hand (the pumps in one unit are offset from the pumps in the other unit by 30°), so that the intake phases of at least two piston pumps overlap (see figure 4 where both the pump offset by 240° and the pump offset by 270° are being actuated at the same time by the cam), without the piston pumps being in phase opposition to one another (they are both in their intake stroke).

Willmann et al. fail to teach that the two pump units are actuated by two separate cams, or that the two pump units are located in two separate planes of the pump housing.

Nakazawa teaches a similar, dual pump unit, where the eccentric unit comprises at least two axially spaced apart cams (35 and 57) and wherein the piston pumps are located in a number of sectional planes of the pump housing that correspond to the number of cams with the axial spacing of the cams being essentially equivalent to the axial spacing of these sectional planes (see figure 1, where pumps (24 and 25) are axial

spaced along with the cams, and are located in two axially spaced planes); and wherein the connecting conduits of the pump units being located in a region of the pump housing defined by the sectional planes (see figure 1, where the connecting inlet passages and radial passages (49, 46) intersect the planes of the pump bodies). It would have been obvious to one of ordinary skill in the art at the time of invention to form the individual brake circuits (I, II) of Willmann et al. in two separate planes of the pump housing, with two separate cams, as taught by Nakazawa, in order to lessen the amount of wear on the cam. In the arrangement of Willmann et al., a single cam must actuate six pistons, while in the apparatus as modified by Nakazawa a single cam would only actuate three pistons.

In Reference to Claim 12

Willmann et al. as modified by Nakazawa teach the multipiston pump in accordance with claim 11 (see the rejection of claim 11 above), wherein at least one of the piston pumps, combined hydraulically into a pump unit, is actuated by a different cam from the respective other piston pumps of the corresponding pump unit (the piston pump that is offset by 0° is actuated by a separate cam than the corresponding pump, which is offset by 30°, of the corresponding pump unit).

In Reference to Claim 13

Willmann et al. as modified by Nakazawa teach the multipiston pump in accordance with claim 12 (see the rejection of claim 12 above), further comprising a rotary angle spacing in the range of between 110° and 130°, preferably of 120° between

two successively actuated piston pumps of a pump unit (the pumps of pump unit I are offset by 120°, see figure 4 of Willmann et al.).

In Reference to Claim 14

Willmann et al. as modified by Nakazawa teach the multipiston pump in accordance with claim 11 (see the rejection of claim 11 above), wherein the rotary angle spacing between successive actuations of two piston pumps is in the range of approximately 30° or in the range of approximately 90° (the angle between pumps is either 30° or 90°, see figure 4 of Willmann et al.).

In Reference to Claim 15

Willmann et al. as modified by Nakazawa teach the multipiston pump in accordance with claim 12 (see the rejection of claim 12 above), wherein the rotary angle spacing between successive actuations of two piston pumps is in the range of approximately 30° or in the range of approximately 90° (the angle between pumps is either 30° or 90°, see figure 4 of Willmann et al.).

In Reference to Claim 16

Willmann et al. as modified by Nakazawa teach the multipiston pump in accordance with claim 13 (see the rejection of claim 13 above), wherein the rotary angle spacing between successive actuations of two piston pumps is in the range of approximately 30° or in the range of approximately 90° (the angle between pumps is either 30° or 90°, see figure 4 of Willmann et al.).

In Reference to Claim 17

Willmann et al. as modified by Nakazawa teach the multipiston pump in accordance with claim 14 (see the rejection of claim 14 above), but do not teach that the cams are spaced by an angle.

However, Nakazawa teaches that the cams are angularly spaced by 180° , see figure 1, which is in the range of approximately 150° . It would have been obvious to one of ordinary skill in the art at the time of invention to space the cams of Willmann et al. by 180° as taught by Nakazawa in order to balance the forces acting on the motor shaft.

In Reference to Claim 18

Willmann et al. as modified by Nakazawa teach the multipiston pump in accordance with claim 11 (see the rejection of claim 11 above), wherein each cam of the eccentric unit drives at least two piston pumps (each cam would drive three piston pumps).

In Reference to Claim 19

Willmann et al. as modified by Nakazawa teach the multipiston pump in accordance with claim 12 (see the rejection of claim 12 above), wherein each cam of the eccentric unit drives at least two piston pumps (each cam would drive three piston pumps).

In Reference to Claim 20

Willmann et al. as modified by Nakazawa teach the multipiston pump in accordance with claim 11 (see the rejection of claim 11 above), wherein the piston pumps that are combined into a pump unit are located spatially immediately adjacent

one another in the pump housing (the pumps associated with a single pump unit are located immediately adjacent one another in a circle formed about the motor shaft).

In Reference to Claim 21

Willmann et al. as modified by Nakazawa teach the multipiston pump in accordance with claim 12 (see the rejection of claim 12 above), wherein the piston pumps that are combined into a pump unit are located spatially immediately adjacent one another in the pump housing (the pumps associated with a single pump unit are located immediately adjacent one another in a circle formed about the motor shaft).

In Reference to Claim 22

Willmann et al. as modified by Nakazawa teach the multipiston pump in accordance with claim 13 (see the rejection of claim 13 above), wherein the piston pumps that are combined into a pump unit are located spatially immediately adjacent one another in the pump housing (the pumps associated with a single pump unit are located immediately adjacent one another in a circle formed about the motor shaft).

In Reference to Claim 26

Willmann et al. as modified by Nakazawa teach the multipiston pump in accordance with claim 11 (see the rejection of claim 11 above), wherein one piston of at least one of the piston pumps is embodied as a stepped piston (Willmann et al.'s pistons are stepped pistons (68)) and defines two pressure chambers each (annular chamber (76) and displacement chamber (74), see figure 2), which are of variable volume in phase opposition to one another (See Willmann et al. columns 5-6 lines 58-9).

In Reference to Claim 27

Willmann et al. as modified by Nakazawa teach the multipiston pump in accordance with claim 12 (see the rejection of claim 12 above), wherein one piston of at least one of the piston pumps is embodied as a stepped piston (Willmann et al.'s pistons are stepped pistons (68)) and defines two pressure chambers each (annular chamber (76) and displacement chamber (74), see figure 2), which are of variable volume in phase opposition to one another (See Willmann et al. columns 5-6 lines 58-9).

In Reference to Claim 28

Willmann et al. as modified by Nakazawa teach the multipiston pump in accordance with claim 20 (see the rejection of claim 20 above), wherein one piston of at least one of the piston pumps is embodied as a stepped piston (Willmann et al.'s pistons are stepped pistons (68)) and defines two pressure chambers each (annular chamber (76) and displacement chamber (74), see figure 2), which are of variable volume in phase opposition to one another (See Willmann et al. columns 5-6 lines 58-9).

In Reference to Claim 29

Willmann et al. as modified by Nakazawa teach an electrohydraulic vehicle brake system, having an external-force-actuated service brake (the brake actuated by the floating piston (16) of Willmann et al.) and a muscle-force-actuated emergency brake (the brake actuated by the foot brake pedal (18) of Willmann et al.), each with two brake

circuits the improvement wherein the service brake is equipped with a multipiston pump as defined claim 11 (see the rejection of claim 11 above).

7. Claims 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Willmann et al. in view of Nakazawa, and in further view of U.S. Patent 1,014,330 to Reeve (Reeve).

In Reference to Claim 23

Willmann et al. as modified by Nakazawa teach the multipiston pump in accordance with claim 11 (see the rejection of claim 11 above), but do not teach that the cams of the pump drive have eccentricities of different sizes.

Reeve teaches a similar compressor apparatus with two planes of pistons, one plane containing valve rods (38), and the other plane containing valve rods (34). The eccentric cams (35, and 39) used to drive these pistons are different sizes (see figure 9), with the eccentric (39) being smaller than the eccentric (35). It would have been obvious to one of ordinary skill in the art at the time of invention to form one cam of the apparatus of Willmann et al. as modified by Nakazawa as smaller than the other cam as taught by Reeve in order to allow less liquid to be pumped by one of the pump units as is well known in the art.

In Reference to Claim 24

Willmann et al. as modified by Nakazawa teach the multipiston pump in accordance with claim 12 (see the rejection of claim 12 above), but do not teach that the cams of the pump drive have eccentricities of different sizes.

Reeve teaches a similar compressor apparatus with two planes of pistons, one plane containing valve rods (38), and the other plane containing valve rods (34). The eccentric cams (35, and 39) used to drive these pistons are different sizes (see figure 9), with the eccentric (39) being smaller than the eccentric (35). It would have been obvious to one of ordinary skill in the art at the time of invention to form one cam of the apparatus of Willmann et al. as modified by Nakazawa as smaller than the other cam as taught by Reeve in order to allow less liquid to be pumped by one of the pump units as is well known in the art.

In Reference to Claim 25

Willmann et al. as modified by Nakazawa teach the multipiston pump in accordance with claim 13 (see the rejection of claim 13 above), but do not teach that the cams of the pump drive have eccentricities of different sizes.

Reeve teaches a similar compressor apparatus with two planes of pistons, one plane containing valve rods (38), and the other plane containing valve rods (34). The eccentric cams (35, and 39) used to drive these pistons are different sizes (see figure 9), with the eccentric (39) being smaller than the eccentric (35). It would have been obvious to one of ordinary skill in the art at the time of invention to form one cam of the apparatus of Willmann et al. as modified by Nakazawa as smaller than the other cam as taught by Reeve in order to allow less liquid to be pumped by one of the pump units as is well known in the art.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JESSICA L. MYERS whose telephone number is (571)270-5059. The examiner can normally be reached on Monday through Friday, 8:30am to 5:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on 571-272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

9. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Devon C Kramer/
Supervisory Patent Examiner, Art
Unit 3746

/JLM